

can correctly sense geomagnetism without any adverse influence caused by the magnetic noise generated from the speaker 19.

It should be understood that in the above-described second and third embodiment modes, such a construction has been shown. That is, both the geomagnetic sensor and the component for generating the harmful magnetic noise such as the speaker are arranged on the same plane under any one of such conditions that the first and second housings are opened and closed. Alternatively, both the geomagnetic sensor and the speaker may be positioned on the same plane under both conditions that the first and second housings are opened and closed.

Also, in the case that magnetic adverse influences are given which are caused by not only a speaker but also any other components such as a receiver and a microphone as the components for generating the harmful magnetic noise, this embodiment mode is similarly applied thereto, and thus, the components and the geomagnetic sensor are arranged on the same plane so as to cancel magnetic force line components along the horizontal direction with respect to the geomagnetic sensor, so that the adverse influence of the magnetic noise other than the geomagnetism can be eliminated.

In accordance with the above-described construction of this embodiment mode, in the compact portable terminal apparatus in which a large number of components are arranged under such a condition that these components are located in proximity to each other in high density, the magnetic adverse influence caused by the component for generating the magnetic noise such as the speaker can be eliminated with respect to the geomagnetic sensor. As a result, the portable terminal apparatus can detect the geomagnetism in high precision to correctly acquire the azimuth information. Also, since the geomagnetic sensor is arranged within the housing made of the non-magnetic material such as the resin mold member, it is possible to avoid that the housing is magnetized by the externally-applied magnetic force while the portable terminal apparatus is carried by the user, so that the high-precision geomagnetic sensing operation can be carried out without adverse influences caused by the externally-applied magnetic field.

Also, the shape of the rear surface of such a housing for arranging therein the geomagnetic sensor is formed in such a manner that when the housing is mounted on the desk, or the like, this rear surface may be horizontally located, and both this rear plane of the housing and the geomagnetic sensor are located substantially parallel to each other. As a result, since the geomagnetic sensor may be easily set to the horizontal condition by merely setting the housing along the horizontal direction, the geomagnetic sensor can be more correctly adjusted, and also, the azimuth can be more correctly measured.

While the present invention has been described in detail, or with reference to the specific embodiment modes, however, the present invention may be apparently modified, changed, and substituted without departing from the technical scope and spirit of the present invention by those skilled in the art.

The present invention has been made based upon Japanese Patent Application NO. 2002-83840 filed on Mar. 25, 2002, by incorporating the contents thereof as a reference.

INDUSTRIAL APPLICABILITY

As previously described, in accordance with the present invention, while the adverse influence of the magnetic noise is eliminated with respect to the geomagnetic sensor pro-

vided in the housing, the high-precision geomagnetism detection can be carried out, and also, the correct azimuth information can be acquired.

The invention claimed is:

1. A portable terminal apparatus having a geomagnetic sensor for sensing geomagnetism and azimuth measuring means for acquiring azimuth information based upon the sensed geomagnetism,

wherein both said geomagnetic sensor and a component for generating magnetic noise are arranged on the same plane within the same housing, while said magnetic noise generating component is positioned in the vicinity of said geomagnetic sensor and gives an influence to a function of said geomagnetic sensor.

2. The portable terminal apparatus as set forth in claim 1, wherein the geomagnetic sensor and the component for generating magnetic noise are arranged on the same plane within the same housing so that the magnetic noise generated from the component is vertically entered into the geomagnetic sensor so as not to give an influence to a function of said geomagnetic sensor.

3. A portable terminal apparatus having a geomagnetic sensor for sensing geomagnetism and azimuth measuring means for acquiring azimuth information based upon the sensed geomagnetism,

wherein both a first housing and a second housing are coupled to each other by way of a hinge portion in such a manner that said first and second housings can be opened/closed, and

wherein said geomagnetic sensor is arranged within said first housing, a component for generating magnetic noise which gives an influence to a function of said geomagnetic sensor is arranged within said second housing, and both said geomagnetic sensor and said component for generating the magnetic noise are positioned on the same plane under at least any one of such conditions that both said first and second housings are closed and are opened.

4. The portable terminal apparatus as set forth in claim 3, wherein the geomagnetic sensor and the component for generating magnetic noise are arranged on the same plane within the same housing so that the magnetic noise generated from the component is vertically entered into the geomagnetic sensor so as not to give an influence to a function of said geomagnetic sensor.

5. A portable terminal apparatus having a geomagnetic sensor for sensing geomagnetism and azimuth measuring means for acquiring azimuth information based upon the sensed geomagnetism,

wherein a plurality of housings are coupled to each other by way of a pivotable portion in such a manner that said plurality of housings can be opened/closed, and

wherein both said geomagnetic sensor and a component for generating magnetic noise which gives an influence to a function of said geomagnetic sensor are arranged within the separate housings respectively, and both said geomagnetic sensor and said component for generating the magnetic noise are positioned on the same plane under at least any one of such conditions that both said plurality of housings are closed and are opened.

6. The portable terminal apparatus as set forth in claim 5, wherein the geomagnetic sensor and the component for generating magnetic noise are arranged on the same plane within the same housing so that the magnetic noise generated from the component is vertically entered into the geomagnetic sensor so as not to give an influence to a function of said geomagnetic sensor.